

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MELVIN K. HOLCOMB,
WILLIAM E. BARNES and STEVEN L. BARDUS

Appeal No. 2004-0140
Application No. 10/154,729

HEARD: APRIL 15, 2004

Before KIMLIN, OWENS and JEFFREY T. SMITH, *Administrative Patent Judges*.

JEFFREY T. SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal the decision of the Primary Examiner finally rejecting claims 27 to 34.¹ We have jurisdiction under 35 U.S.C. § 134.²

¹ According to Appellants, claims 1 to 20 have been indicated as containing allowable subject matter. (Brief, p. 2).

² In rendering this decision, we have considered Appellants' arguments presented in the Brief filed July 23, 2003 and the Reply Brief filed September 29, 2003.

BACKGROUND

Appellants' invention relates to a method for making a hollow sputter target assembly. The scope of Appellants' invention can be ascertained from representative claim 27, which is reproduced below:

27. A method of forming a sputter target assembly comprising the steps of:
providing a first metallic material;
providing a second metallic material;
forming said first metallic material and said second metallic material into a cup-shaped sputter target assembly including an outer shell composed of said second metallic material and a sputtering insert composed of said first material;
bonding said first metallic material to said second metallic material;
wherein said sputtering insert is disposed within said outer shell such that said sputter target assembly includes an outer substantially cylindrical wall defined by said outer shell and an inner substantially cylindrical wall defined by said sputtering insert.

CITED PRIOR ART

As evidence of unpatentability, the Examiner relies on the following prior art:

Shimomuki et al. (Shimomuki) Filed December 3, 1997	6,085,966	July 11, 2000
Kulkarni et al. (Kulkarni) Filed August 3, 1999	6,283,357	Sep. 04, 2001

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The Examiner rejected claims 27 to 32 and 34 under 35 U.S.C. § 102(e) as anticipated by Kulkarni; and claims 27 to 34 under 35 U.S.C. § 103(a) as obvious over the combination of Kulkarni and Shimomuki. (Final Rejection, pp. 2-5).

DISCUSSION

We have carefully reviewed the claims, specification, provisional application 60/110,765 and applied prior art, including all of the arguments advanced by both the Examiner and Appellants in support of their respective positions. This review leads us to conclude that the Examiner's rejections are well founded.

Rather than reiterate the conflicting viewpoints advanced by the Examiner and Appellants concerning the above-noted rejections, we refer to the Answer and the Briefs.

According to Appellants, the present application, 10/154,729, is a continuation of US application serial no. 09/807,261, filed April 9, 2001, now US patent 6,419,806, which is a 371 of PCT/US//9928723, filed December 3, 1999 and published under PCT 21(2), which claims priority from the US provisional application serial no. 60/110,765, filed December 3, 1998. (Specification, page 1).

The Kulkarni reference is available as prior art only if Appellants are not entitled to the benefit under 35 U.S.C. § 120 of the earlier filing date of their U.S.

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provisional application. The Examiner determined that the claims of this application are not entitled to the benefit of provisional application Serial No. 60/110,765, under 35 U.S.C. § 120 because that application purportedly does not disclose the subject matter now claimed in the manner provided by 35 U.S.C. § 112, first paragraph. (Answer, p. 3).

The issue to be resolved in this appeal is whether the claims on appeal are entitled to the benefit of the filing date of the provisional application Serial No. 60/110,765 under 35 U.S.C. § 120.³ We conclude that substantial evidence does not support the conclusion that the provisional application 60/110,765 specification meets the written description requirement relative to claims 27 to 34 of the present application. Thus, we agree with the Examiner's determination that the claims on appeal are not entitled to the benefit of the earlier filing date of the provisional application under 35 U.S.C. § 120.

The relevant portions of the provisional application 60/110,765 appear below:

General Purpose of the Intention:

To make a target for sputtering in an OEM system that is easier to handle and reduces cost of ownership to the customer. By replacing

³ The Appellants have failed to provide a substantive discussion of the technological merits of the cited references.

unused high purity expensive sputtering material with low purity Aluminum or steel, the cost of ownership will be reduced. This also reduces the overall weight of the assembly by a substantial margin, because the low purity Aluminum is much lighter than the sputtering material (Titanium, Copper, Tantalum, Cobalt and Tungsten). The reduction in weight will help reduce the need for special equipment for placing the targets into the sputtering chambers and may reduce the likelihood of particle generation caused by manipulating the cumbersome target into the system.

Prior Art:

New design target for OEM. Targets being produced today are monolithic in design

Disadvantages of Prior Art

These are several disadvantages to the product being made today:

- Expensive unused target sputtering material (material efficiency)
- Weld issues with exotic materials such as Ta, Ti, Cu, Co and W
- Weight of sputtering material is much greater than Aluminum
- Difficult to product in monolithic design

Identify the mode of operation parts and step of the invention:

The target assembly is made up of commercial grade Al alloy or steel to sputtering material such as Titanium, Copper, Tantalum, Cobalt and Tungsten. Attached are drawings to describe the assembly. The outer wall of the assembly is the commercial grade Aluminum alloy or steel and on the interior is the bonded sputtering material (Ta, Ti, Cu, Co and W). There are currently two methods used to bond the two materials. The first is a shrink fit design using the differences in thermal heat expansion between the sputtering material and the commercial grade Aluminum alloys. The differences are enough to create a bond, which can sustain substantial shear stress. The second and safe method is to diffusion bonding the two materials creating a strong chemical bond. Both

are acceptable bonding methods, but the latter may be more accepted by the industry due to the added safety factor.

Shrink fit method

- Machine the two materials so there is a 0.060 of an inch difference between the ID of the Aluminum alloy and the OD of the sputtering material.
- Heat the Aluminum alloy to 900 °F for about 1 hour or until part is at temperature
- Place the cold sputtering material into the heated Aluminum alloy before it cools.
- If needed press the assembly together.
- Air-cool the assembly to room temperature.

Diffusion bond Technique

- Machine the two materials with minimal difference between the OD of the Aluminum alloy or steel and ID of the sputtering material.
- Place an insert into the cavity to reduce distortion during diffusion bonding
- Place all three parts in a Hot Isostatic Press (HIP) can and weld the vacuum seal can.
- HIP the materials together at a prescribed time, temperature and pressure (ex. 3 hours at 450 °C and 30 Ksi).

Alternate embodiments of the invention:

- Self enclosed HIP can
 - Replace steel can that surround entire assembly by e-beam welding an Al alloy top to the Al body in vacuum to create the seal.
 - This assembly is then placed in the HIP vessel at the parameters stated above

Multi piece assembly:

- Slit the Ta body or other sputtering material into two pieces
- Tube

- Bottom
- HIP the two piece to a Nb, Steel, Ta, Cu, Co, W or Ti flange.
- All parts would be HIP together in one steel can.

Advantages of the invention over prior art:

Below is a list of advantages over prior art:

- Much more material efficient
- Reduction in weight
- Known welding methods for Aluminum
- Ease of fabricating the assembly
- More repeatable process

Features of the invention believed to be new:

There are a couple of features that are believed to be new. One is the two piece design of the target and the other is the method used to bond the two materials together.

Appellants assert that the method of making the sputter target assembly, according to present invention, comprises forming a blank of the first metallic material into a sputtering insert and forming a blank of the second material formed into an outer shell. In one embodiment the target assembly is shaped and subsequently HIPed (hot isostatic press) to diffusion bond the sputtering insert to the outer shell. In the second embodiment, the target assembly is shaped and the outer shell and sputtering insert are shrink fitted to provide an interference type fit between the components. Appellants' asserted third embodiment, a blank from the first metallic material and a blank from a second metallic material are first bonded together to form a blank assembly. Subsequently, the blank assembly is then formed

into the hollow or cup shaped configuration. (Brief, p. 3).

The Examiner determined that the Kulkarni reference discloses a method for forming a sputtering target assembly that comprises bonding a blank from the first metallic material and a blank from a second metallic material together to form a blank assembly. Subsequently, the blank assembly is then formed into the hollow or cup shaped configuration. (Final Rejection, p. 3).

The Examiner determined that claims 27 to 34 are not fully supported by the provisional application. Specifically, the Examiner determined that the claims encompass the first bonding the first metallic material and the second metallic material together to form a blank assembly. Subsequently, the blank assembly is then formed into the hollow or cup shaped configuration.⁴ (Final Rejection, p. 5).

Appellants argue that “the Examiner has not compared the limitations of claims 27-34 with the priority document to assess the support issue. Instead, the Examiner improperly inserted additional limitations into claims 27-34 and then found that those freshly inserted limitations were not supported in the priority document. (Brief, p. 4). Appellants acknowledge that the subject matter of claim 27 encompasses the description of the Kulkarni reference identified by the Examiner. (Brief, p. 5).

⁴ This is the same subject matter described by Kulkarni.

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Appellants assert that the particular timing of the bonding and formation are not set forth in the appealed claims. (Brief, p. 5). Appellants assert that the limitation of claim 27, “forming said first metallic material and said second metallic material into a cup-shaped sputter target assembly including an outer shell composed of said second metallic material and a sputtering insert composed of said first material”, is disclosed in the provisional application by the following:

Page 1, lines 21-22 and the Drawing Figure. Under the headings “Shrink Fit Method” and “Diffusion Bond Technique,” the materials are machined (i.e. formed) into the cup shaped shown in the drawings. [Brief, p. 6].

We agree with Appellants that timing of the bonding and formation are not set forth in the appealed claims. We find that the drawing figure of the provisional application does not provide information about the method of forming the sputter target assembly but is representative of the product. However, contrary to Appellants’ position, we find that the discussion in the provisional application describing the bonding techniques under the headings identified by the Appellants provides a specific order for the forming and bonding steps. In each description, the metallic materials are formed prior to bonding. In each description the sputtering material is machined and subsequently placed into the Aluminum alloy before they are bonded.

The entitlement of an application to an earlier filing date extends only to that which is disclosed in prior application, and does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997); *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991)(“[T]he applicant must also convey to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the ‘written description’ inquiry, whatever is now claimed.”) . In the present case the Appellants, in the provisional application, have indicated that the only methods for bonding the first material to the second material are the shrink fit and the diffusion bond technique. Specifically, the provisional application states “There are currently two methods used to bond the two materials. The first is a shrink fit design using the differences in thermal heat expansion between the sputtering material and the commercial grade Aluminum alloys. The differences are enough to create a bond, which can sustain substantial shear stress. The second and safe method is to diffusion bonding the two materials creating a strong chemical bond.” Appellants’ further description of the bonding methods disclose, in order to achieve proper bonding, specific criteria for the machined (i.e. formed) metallic materials. Specifically, the machined metallic materials must have

a minimal difference between the OD of the Aluminum alloy or steel and the ID of the sputtering material. Thus, the provisional application clearly conveys to one skilled in the art that in this invention the characteristics of the difference between the OD of the Aluminum alloy or steel and the ID of the sputtering material are what make the bonding work. There is no indication that proper bonding would occur between the two substrates where the metallic materials did not have a minimal difference between the OD of the Aluminum alloy or steel and the ID of the sputtering material. Since the provisional application discloses specific criteria for the machined (i.e. formed) metallic materials, we do not believe that the process of bonding and forming in no particular order would flow naturally to a person of ordinary skill in the art.^{5, 6}

The provisional application discloses that the invention provides advantages over the prior art. However, there is no indication that these advantages would have been achieved by embodiments not disclosed therein, i.e., a process where bonding occurs before forming. Consequently, the provisional application does not provide

⁵ Moreover, Appellants in the provisional indicated that the method used to bond the two materials together is believed to be new. (See the Provisional Application copied above, Decision, p. 7).

⁶ The provisional application provides additional description of alternative embodiments of the invention. However, these alternative embodiments do not disclose a process where bonding occurs before forming.

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written descriptive support for the appealed claims that encompass bonding before the forming step.

Appellants also assert that the limitation of claim 27, “bonding said first metallic material to said second metallic material;” is disclosed in the provisional application by the following:

Page 1, lines 21-42:
Shrink fit, diffusion bonding methods, and HIP can embodiment, are all ways in which the first material is bonded to the other.
[Brief, p. 6], (underlining added).

We find that claim 27 is not limited to specific bonding techniques. Specifically, claim 27 is not limited to bonding by the “Shrink Fit Method” and “Diffusion Bond Technique” as disclosed in the provisional application. As acknowledged by Appellants, “claim 27 is broad enough to ‘encompass’ the sequential bonding and formation steps”. (Brief, p. 5, second paragraph). In view of the above, the provisional application does not provide descriptive support for claims 27 to 34 in the manner provided for in the first paragraph of § 112.

We conclude that the subject matter now claimed in this application is not described in the provisional application Serial No. 60/110,765 in the manner required by 35 U.S.C. § 112, first paragraph. Accordingly, the claims on appeal are

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not entitled under 35 U.S.C. § 120 to the benefit of the earlier filing date of this provisional application.

We affirm the Examiner's §§ 102 and 103 rejections since the claims on appeal are not entitled under 35 U.S.C. § 120 to the benefit of the earlier filing date of this provisional application and Appellants have failed to otherwise address the §§ 102 and 103 rejections. The rejections of claims 27 to 32 and 34 under 35 U.S.C. § 102(e) as anticipated by Kulkarni; and claims 27 to 34 under 35 U.S.C. § 103(a) as obvious over the combination of Kulkarni and Shimomuki are affirmed.

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Time for taking action

No time period for taking any subsequent action in connection with this
appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

EDWARD C. KIMLIN
Administrative Patent Judge

JEFFREY T. SMITH
Administrative Patent Judge

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Owens, Administrative Patent Judge, dissenting.

The examiner argues that “[n]owhere does the provisional application ever disclose or lead a skilled artisan to first bonding the first and second metallic materials and then, after bonding, machining the bonded materials to form a cup-shaped assembly” (final rejection mailed March 3, 2003, paper no. 8, page 6), and that “[i]n all situations disclosed in said provisional application, forming occurs before bonding, and there is nothing in said provisional application that would have lead [sic] a skilled artisan to perform the bonding step before the forming step” (answer, page 5). These arguments indicate that the alleged deficiency in the appellants’ provisional application is that it does not provide adequate written descriptive support under 35 U.S.C. § 112, first paragraph, for the claimed invention.

Regarding the written description requirement of 35 U.S.C. § 112, first paragraph, the Federal Circuit has stated that “[t]he test to determine if an application is to receive the benefit of an earlier filed application is whether a person of ordinary skill in the art would recognize that the applicant possessed what is claimed in the later filed application as of the filing date of the earlier filed application.” *Noelle v. Lederman*, 355 F.3d 1343, 1348, 69 USPQ2d 1508, 1513 (Fed. Cir. 2004). A predecessor of the Federal Circuit stated that it cannot agree

“that in every case where the description of the invention in the specification is narrower than that in the claim there has been a failure to fulfill the description requirement in section 112.” *In re Smythe*, 480 F.2d 1376, 1382, 178 USPQ 279, 284 (CCPA 1973). Instead, the court stated, “[e]ach case must be decided on its own facts.” *Id.*

The appellants’ claims require a forming step and a bonding step, in no particular order. The appellants’ provisional application states that the two bonding methods currently used are shrink fit and diffusion bonding, and indicates that in each of those techniques a forming step takes place before the bonding step (page 1). Hence, one of ordinary skill in the art would have recognized from the provisional application that the appellants were in possession of a method that includes both the forming step and the bonding step required by the present claims. Although the claims encompass bonding before forming, that sequence is not required by the claims. The claims merely require a bonding step and a forming step, and the provisional application discloses methods that include those steps.

In both of the methods disclosed in the provisional application, two layers are machined to a minimum difference between the inside diameter of the outer layer and the outside diameter of the inner layer, and then the formed layers are bonded together. Thus, there is a potential issue under 35 U.S.C. § 112, first paragraph, of

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whether the provisional application would have enabled one of ordinary skill in the art to carry out the bonding step before the forming step, i.e., whether the claimed invention is broader than the enabling disclosure in the provisional application.

That issue, however, is not before us.

As for the issue before us, i.e., written description, as discussed above the appellants' provisional application provides adequate written descriptive support for the forming and bonding steps in the appellants' claims, and there is no dispute as to whether the provisional application provides adequate written descriptive support for the other elements of the appellants' claims. Hence, the finding supported by the record is that the appellants are entitled to the filing date of their provisional application and that, therefore, Kulkarni, which was filed after the appellants' provisional application, is not prior art. Accordingly, I would reverse the rejections.

TERRY J. OWENS
Administrative Patent Judge

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